a. The Office Action suggested that on page 8, line 18, the term --allows-- be replace with the term --allow--.

b. The Office Action suggested that page 10, line 29 be updated to show correct units. In response, applicants changed "(m" to --mm-- to clarify the units.

c. The Office action suggested that, "reference character '116' has been used to designate both an end (page 10, line 18) and a housing (page 10, line 20). In response applicants have amended above and submitted new formal drawings, which change the specification and drawing such than numeral "117" indicates the housing and numeral "116" indicates the ends.

d. The Office Action suggested that reference character "414" has not been included in the drawings. Applicants have added the character to the new drawings.

e. The Office Action suggested that reference character "108" has not been included in the drawings. Applicants have added the character to the new drawings.

f. The Office Action suggested that reference character "272" has been used to designate both a rigid frame (page 15, line 27) and a dielectric sheet (page 15, line 28). In response, applicants have changed "sheet 272" to "sheet 270" to be consistent with the rest of the application.

g. The Office Action suggested that reference character "278" has not been included in the drawings. Applicants have removed the character from the application.

h. The Office Action suggested that reference character "288" has not been included in the drawings. Applicants have changed the character to "248" in the specification to correspond with the rest of the application.

i. The Office Action suggested that reference character "296" has not been included in the drawings. Applicants have added the character to the new drawings.

j. The Office Action suggested that a reference is missing on page 22, line 26. Such reference has been added to the application.

k. The Office Action suggested that reference character "514" has not been included in the drawings. Applicants have removed the character from the application.

II. Drawings

The Office Action objected to the drawings. The Office Action suggested that the drawings included reference numbers "128" in Figure 2; "170" in Figure 4; and "248" in Figure 6; which were not in the specification. A new set of formal drawings is submitted herewith and has the following changes:

Reference numeral "128" has been removed from Figure 2.

Reference numeral "170" has been changed to "116" in Figure 4 to correspond to the specification.

With regard to reference numeral "248", Applicants point out that the specification recites numeral "248" at page 15, line 12.

The Office Action also suggested that reference number "502" in Figure should be "520". Such change has been made.

III. Claim Objections

The Office Action objected to claim 21 because it was dependent on claim 22. Claim 21 has been amended to be dependent upon claim 20 as suggested by the Office Action.

IV. Claim Rejections under 35 U.S.C. 101

The Office Action rejected claim 18 under 35 U.S.C. 101 suggesting that the claim discloses an invention that "is inoperative". The Office Action also suggests that the, "applicant intends the term 'protrusion', as in claim 1, to be defined as a probe means, since claim 1 distinguishes a protrusion from an opening." However, the Office Action misinterprets that term "protrusion". The Examiner is directed to page 4, line 5 as follows:

> As used herein, the term "protrusions" generally refers to controlled forces or displacements applied by a probe, or device to a fabric sample for causing at least a portion of the fabric sample to be forced through an opening defined in a plane of a sample support member. Preferably a protrusion as used herein will be of sufficient magnitude for effecting such sample manipulation without

piercing the sample. In some embodiments, however, it is contemplated that piercing will or desirably should occur.

Thus, the term protrusion generally refers to a force or displacement, which though may be achieved by use of a probe means, is not so limited. In light of this information, Applicants request that the rejection of claim 18 under 35 U.S.C. 101 be withdrawn.

V. Rejections under 35 U.S.C. 103

The Office Action rejected claims 1-35 and 50 under 35 U.S.C. 103(a) as being, unpatentable over combinations of U.S. Patent Nos. 3,835,697, 5,795,989, 3,618,372, 3,818,751, 2,786,352, 4,567,774, 3,151,483, 3,613,445 and 2,590,839 respectively to Schmider, Simmons, Beckstrom, Karper, Sobota, Manahan, Plummer, Dent and Clapham. Applicants respectfully traverse these rejections and request reconsideration in light of the following remarks. To expedite prosecution, however, Applicants have amended claim 1.

Applicants traverse on at least two grounds. First, Applicants believe that the claim rejections are legally inadequate since the motivation cited by the Office Action to combine the references of record is legally inadequate. Second, all the limitations of claims are not taught or suggested by the references of record.

For rejecting claim 1 and claims 2-31 of the present application, the Office Action asserts a strained combination of three references and suggests that since one step of claim 1 is taught by each of the three references, the claimed invention is obvious. In particular, the Office Action reads, at page 6, that, "Schneider clearly anticipates the first step of claim 1...Sobota clearly anticipates the second step of claim 1...[and] Dent clearly anticipates the third steps of claim 1..." The Office Action then reads that a, "prima facie case to combine references by one of ordinary skill in the art has been established by the fact that all the references are within the same technology of testing fabric/sheet materials." Thereafter, the Office Action reasserts this same "prima facie case to combine references" for using additional references to reject the claims dependent on claim 1 (i.e., claims 2-31) and to reject claims 32-34.

This rejection of claim 1, its dependents and claims 32-34 is legally inadequate

because the reason for combination of the references in the office action is too broad. As the CAFC wrote in In re Lee, (CAFC, 2002), emphasis added, "there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant" *See also In re Fine,* 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Dow Chemical Co.*, 5 USPQ2d 1529 (Fed. Cir. 1988); *In re Geiger*, 2 USPQ2d 1276 (Fed. Cir. 1987). In contrast to this requirement, the Office Action suggests, at page 6, that three different steps from three different references can be combined for an obviousness rejection merely because the references come from one very large category of technology (i.e., "testing fabric/sheet materials"). Such a rejection is based upon hindsight and should be withdrawn.

Applicants also traverse the present rejections on the ground that not all of the limitations of the claims are taught or suggested by the references of record or the prior art. The Office action reads, at page 8, that, "Claims 4, 5, and 6 are each directed to the method of claim 1 comprising throughput rates for each fabric sample of not greater than ten minutes, not more than two minutes, and not more than 20 seconds." The Office Action further reads that, "Schneider, Sobota and Dent do not disclose that their devices are limited to operating during a specific time period." Based on this, the Office Action makes the conclusory statement that the, "devices of Schneider, Sobota or Dent individually have the inherent capability to test a fabric sample within or for any amount of time desired."

Such a conclusory statement, which is based upon what the references of record do not teach or suggest, is inadequate to satisfy the legal requirements of an obviousness rejections. As the CAFC wrote in reversing the BPAI, "The board cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies." In re Lee, 61 USPQ2d 1430, 1435 (CAFC, 1997). Thus, the conclusory statement in the Office Action does not substitute for some teaching or suggestion in the prior art to perform the method of the present invention at the rates in claims 4, 5 and 6.

In conclusion, Applicants contend that the rejections in the Office Action are legally inadequate and should be withdrawn.

VI. Claim 1 Amendments

Claim 1 has been amended to provide "four" samples on "at least one substrate" and "protrusions of each of the samples...are caused at a throughput rate no greater than about two minutes per sample." Applicants believe that these amendments distinguish even further over the references of record, particularly in view of the remarks above.

The foregoing amendments are taken in the interest of expediting prosecution and there is no intention of surrendering any range of equivalents to which Applicant would otherwise be entitled in view of the prior art.

By amending the application, the Applicants do not concede that the patent coverage available to them would not extend as far as the original claim. Rather, Applicants intend to file a continuation application to pursue the breadth of the claims as filed. Applicants believe that the Examiner has not made a sufficient showing of inherency of the teachings of the asserted prior art, especially given the lack of teachings in the cited references of the properties that Applicants have recited in their claims.

Further, by the present amendment, it does not follow that the amended claims have become so perfect in their description that no one could devise an equivalent. After amendment, as before, limitations in the ability to describe the present invention in language in the patent claims naturally prevent the Applicants from capturing every nuance of the invention or describing with complete precision the range of its novelty or every possible equivalent. See, Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 62 USPQ2d 1705 (2002). Accordingly, the foregoing amendments are made specifically in the interest of expediting prosecution and there is no intention of surrendering any range of equivalents to which Applicants would otherwise be entitled.

CONCLUSIONS

In view of Applicants' amendments and remarks, the Examiner's rejections are believed to be rendered moot. Accordingly, Applicants submit that the present

application is in condition for allowance and requests that the Examiner pass the case to issue at the earliest convenience. Should the Examiner have any question or wish to further discuss this application, Applicant requests that the Examiner contact the undersigned at (248) 593-9900.

If for some reason Applicant has not requested a sufficient extension and/or have not paid a sufficient fee for this response and/or for the extension necessary to prevent the abandonment of this application, please consider this as a request for an extension for the required time period and/or authorization to charge Deposit Account No. 50-0496 for any fee which may be due.

Respectfully submitted,

Dated: 4-9, 2003

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

Paragraph on page 8, beginning at line 7 has been amended as follows:

Fig. 3A shows a cross-sectional view of one preferred sample holder 102 which is comprised of a first plate 402 having a plurality of through-holes 406 and a second plate 404 having a plurality of openings 407 wherein the through-holes 406 and the openings 407 are aligned with each other forming tunnels 410 within the sample holder 102. Since the array 230 are protruded through the openings 407, their size and shape can affect the fabric handle measurements and are taken into consideration in measuring the fabric handle of the array 230. For instance, each of the openings 407 preferably is large enough for the array sample 230 to collapse upon itself, while still maintaining a portion of itself in physical contact with the walls of the opening 407 during the protrusions. Referring to Fig. 3A, one preferred leading edge 408 to the opening 407 must allow[allows] for a smooth transition for the sample 230 to transfer from a flat state to the bent and folded state which occurs during the protrusions. Thus, it is preferred that the opening 407 is constructed of a smooth material or coated with a smooth material (e.g., a plastic layer, a coating, or the like). Although the openings 407 can be any shape and/or size, it is preferred that they are funnel-shaped or otherwise a rounded or a tapered periphery with a diameter at the top of each funnel that is twice of the bottom diameter, and with the height of the sloped section at least equal to the height of the straight section. For examples of other preferred embodiments of the openings 407 that may be used during fabric handle screens, see Fig. 3C-J. Other variations or combinations of such structures are also possible. The through-holes 406 can also be any shape or size as long as they do not restrict or inhibit the protrusions of the array 230 by the probes 104. Furthermore, depending on the direction of the protrusions, the first plate 402 may be placed above the second plate 404 with its openings 407 as shown in Fig. 3A, or vice versa, as shown in Fig. 3B.

Paragraph on page 10, beginning at line 9, has been amended as follows:

The PDMA 100 includes at least one actuator for moving the probes 104 and the samples 230 in relation to each other. In one preferred embodiment, the actuators are attached to the probes 104 and the samples 230 remain stationary. In another preferred embodiment, the actuators are attached to the sample holder 102 and the probes remain stationary. In yet another preferred embodiment, both the probes 104 and the sample holder 102 have actuators attached allowing them to both become non-stationary. In an exemplary preferred embodiment, the PDMA 100 includes first 110 and second 112 translation actuators for displacing the array 230 in a direction normal 114 to surfaces containing the array 230 and the ends 116 of the probes 104. The first translation actuator 110, which is attached to the sample holder 102 via a housing 117[housing 116] that surrounds the second translation actuator 112, provides relatively coarse displacement of the sample holder 102. A useful first translation actuator 110 includes a motorized translation stage available from POLYTEC PI under the trade name M-126 Translation Stage, which has a translation range of 25 mm and a resolution of 0.1 μm. The second translation actuator 112, which is attached directly to the sample holder 102, provides relatively fine displacement of the sample holder 102. A useful second translation actuator 112 includes a preloaded piezoelectric stack available from Polytec PI under the trade name P-753 LISA Linear PZT Stage Actuator, which has a translation range of 30 mm[(m] and can provide a 100-N pushing force and a 20-N pulling force. The PDMA 100 typically controls the first 110 and second 112 translation actuators using a DC motor controller and an amplifier/position servo controller, respectively, which are linked to a suitable general-purpose computer (not shown). In an alternative embodiment, the first 110 translation actuator is mounted on an x-y translation stage (not shown), which allows movement of the sample holder 102 in a direction substantially parallel to the surfaces containing the array 230 and the ends of the probes 104. This latter embodiment is useful when the sample holder 102 must be moved laterally to align different groups of array samples

230 with the probes 104 during screening—i.e., when the PDMA employs fewer probes 104 than samples in the array 230 and the probes 104 are stationary.

Paragraph on page 15, beginning at line 23, has been amended as follows:

Fig. 7 and Fig. 8 provide further details of the sensors 106 and sensor boards 232, 234, showing respectively, a bottom perspective view and a close-up top view of the first sensor board 232. The first 232 and second 234 sensor boards generally comprise a flexible multi-layer dielectric sheet 270 (e.g., polyimide) and a rigid frame 272 (e.g., FR-4 epoxy glass laminate) that is bonded to the periphery of the dielectric sheet 270[sheet 272]. Electrically conductive traces 274 are embedded on top 276 or bottom surfaces [278] of the dielectric sheet 270, or between layers of the flexible sheet 270, forming a double-sided flex circuit 280. Each sensor 106 is mounted on the top surface 276 of the flex circuit 280, and leads 282 on the sensors 106 are connected to conductive traces 274 that terminate at a standard card edge connector 284. Conventional ribbon cables can be used to link the card-edge connector 284 with peripheral recording and control devices (not shown) allowing communication between the sensors 106 and the peripheral devices.

Paragraph on page 16, beginning at line 30, has been amended as follows:

Referring to Fig. 6-8, threaded holes 248[288], 290 in the upper 236 and lower 238 support plates are sized to receive set-screws 292 that the PDMA 100 can use to pre-load each of the sensors 106 mounted on either the first 232 or second 234 sensor boards. As noted in the description of Fig. 4, the flexure strips 150 used to align the probes 104, are compliant for displacements normal 114 to the plane containing the array 230, but are mechanically stiff for displacements in other directions. Moreover, the effective spring constants of the flexure strips 150 are substantially less than the spring constants of the sensors 106 so that the flexure strips 150 ordinarily exert minimal influence on the measured responses of the array 230 to protrusions. However, since the sensors 106 are mounted on the flex circuit

280, the set-screws 292 can apply a force to the stiffeners 286 and the sensors 106 in absence of a force on the test fixture 118. A force recorded by the sensors 106 will therefore be the sum of the force acting on the test fixture 118 and the pre-load force. Since many commercial force sensors can detect only tensile or compressive loads, pre-loading permits a compressive sensor to detect small tensile loads, or a tensile sensor to record small compressive loads, expanding the capabilities of the PDMA 100. Note that the lower support plate 238 and the second sensor board 234 both include unthreaded holes 294, 296 that provide access to the set-screws 292 in the upper support plate 236.

Paragraph on page 22, beginning at line 18, has been amended as follows:

Fig. 10 shows a perspective view of another instrument suitable for screening, and specifically, an automated rapid serial system (ARSS) 500 that can be used to conduct high throughput fabric handle screening of an array of fabric samples by measuring responses of the array samples to protrusions. The ARSS 500 can be configured for use with parallel, serial or serial-parallel protocols. In a most preferred embodiment, the ARSS 500 can be configured for use in a rapid serial fashion with a high sample screening throughput. Detailed description of the ARSS 500 is described in commonly owned and co-pending U.S. Patent Application Serial No. 09/939,252[Serial No. _____] titled "High Throughput Mechanical Rapid Serial Property Testing of Material Libraries," (P. Mansky) filed on August 24, 2001, which is herein incorporated by reference. Generally, ARSS 500 includes a variety of robotic instruments for automatically or programmably providing predetermined motions for protruding an array of fabric samples 502 according to a predetermined protocol. ARSS 500 may be adapted or augmented to include a variety of hardware, software or both to assist it in determining the fabric hand of the array members. Hardware and software for augmenting the robotic systems may include, but are not limited to, sensors, transducers, data acquisition and manipulation hardware, data acquisition and manipulation software and the like. Exemplary robotic systems are

commercially available from CAVRO Scientific Instruments (e.g., Model NO. RSP9652) or BioDot (Microdrop Model 3000).

Paragraph on page 24, beginning at line 28, has been amended as follows:

The ARSS 500 includes actuator(s) [514] for moving the probe(s) 512 and the samples 502 in relation to each other. In one preferred embodiment, the actuator [514] is attached to the probe 512 and the samples 502 remain stationary. In another preferred embodiment, the actuator [514] is attached to the sample holder 504 and the probe 512 remains stationary. In yet another preferred embodiment, both the probe 512 and the sample holder 504 have actuators [514] attached allowing both of them to translate.

In the Claims:

Claims 4 and 5 have been canceled. Claims 1 and 21 have been amended as follows:

1. (Amended) A method for screening fabric handle of an array of fabric samples, comprising:

providing an array of at least four [two] fabric samples upon at least one substrate;

[protruding] causing protrusions of each of said fabric samples through openings in said at least one substrate wherein said protrusions are caused by contacting a probe with said fabric samples using an automated system that moves said probe, said fabric samples, or both relative to each other and wherein said protrusions are caused at a throughput rate no greater than about two minutes per sample; and

monitoring a response of each of said fabric samples to said protrusions for assisting in measuring relative fabric handle for each of said fabric samples.

21. (Amended) The method of Claim 20 [22], wherein a gap of at least about one millimeter gap exists between said first plate and said second plate.